Farm Service Agency

Using GIS in Disaster Assistance

North Dakota GIS Users Conference

September 11-13, 2007

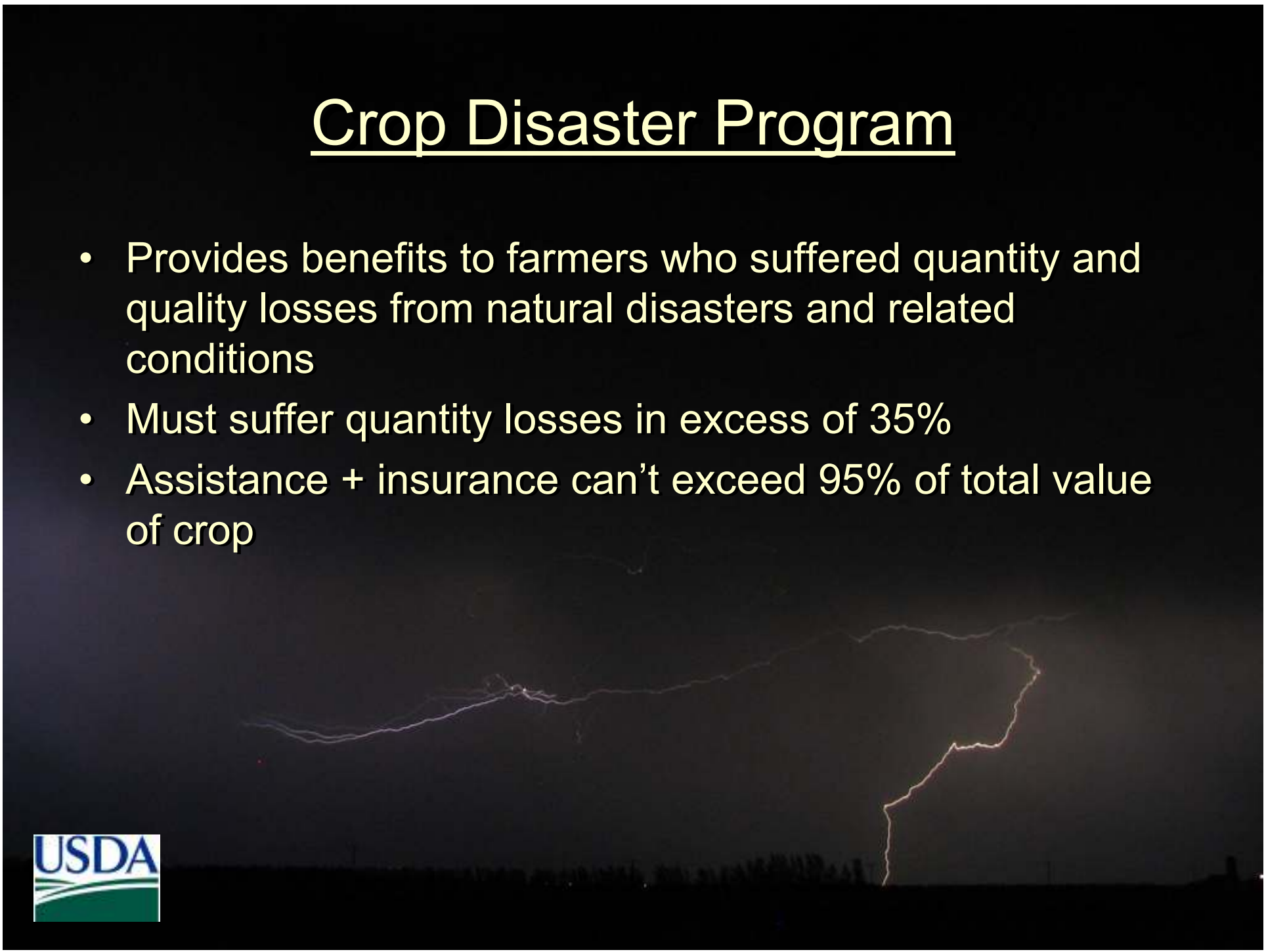
Agricultural Assistance Act of 2007

- Provides approximately $3 billion in agricultural disaster aid
  - Crop Disaster Program (CDP)
  - Livestock Compensation Program (LCP)*
  - Livestock Indemnity Program (LIP)*
  - Dairy Disaster Assistance Program (DDAP)*
  - Emergency Conservation Program (ECP)
  - Emergency Forestry Conservation Reserve Program (EFCRP)

* Only in disaster declared/designated counties

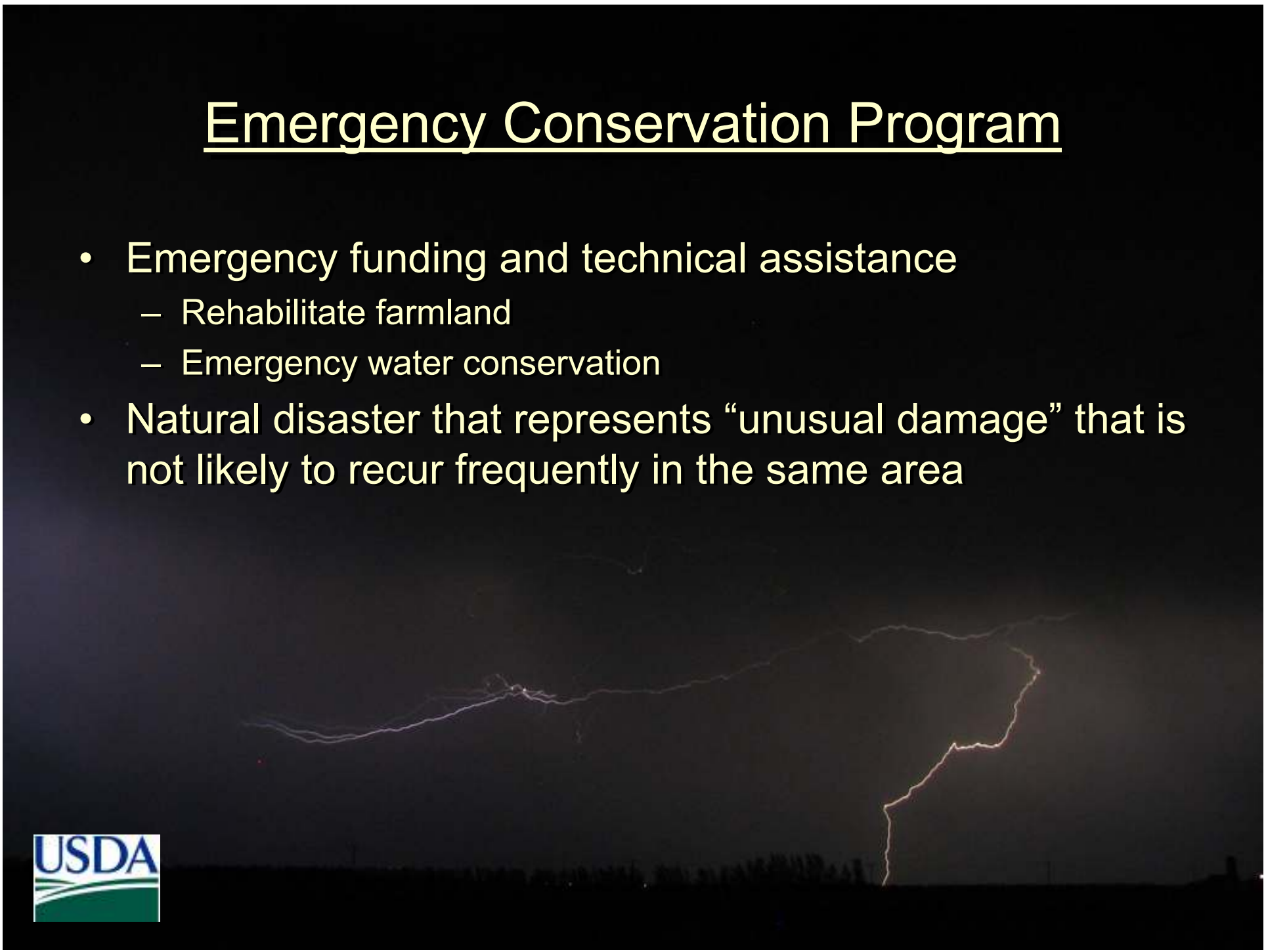
Crop Disaster Program

- Provides benefits to farmers who suffered quantity and quality losses from natural disasters and related conditions
- Must suffer quantity losses in excess of 35%
- Assistance + insurance can't exceed 95% of total value of crop



Emergency Conservation Program

- Emergency funding and technical assistance
  - Rehabilitate farmland
  - Emergency water conservation
- Natural disaster that represents “unusual damage” that is not likely to recur frequently in the same area



Disaster Assistance Process

- Four types of disaster designations:
  - Presidential major disaster declaration (FEMA)
  - USDA Secretarial disaster designation
  - FSA Administrator's Physical Loss Notification
  - Quarantine designation

USDA Secretarial Designation

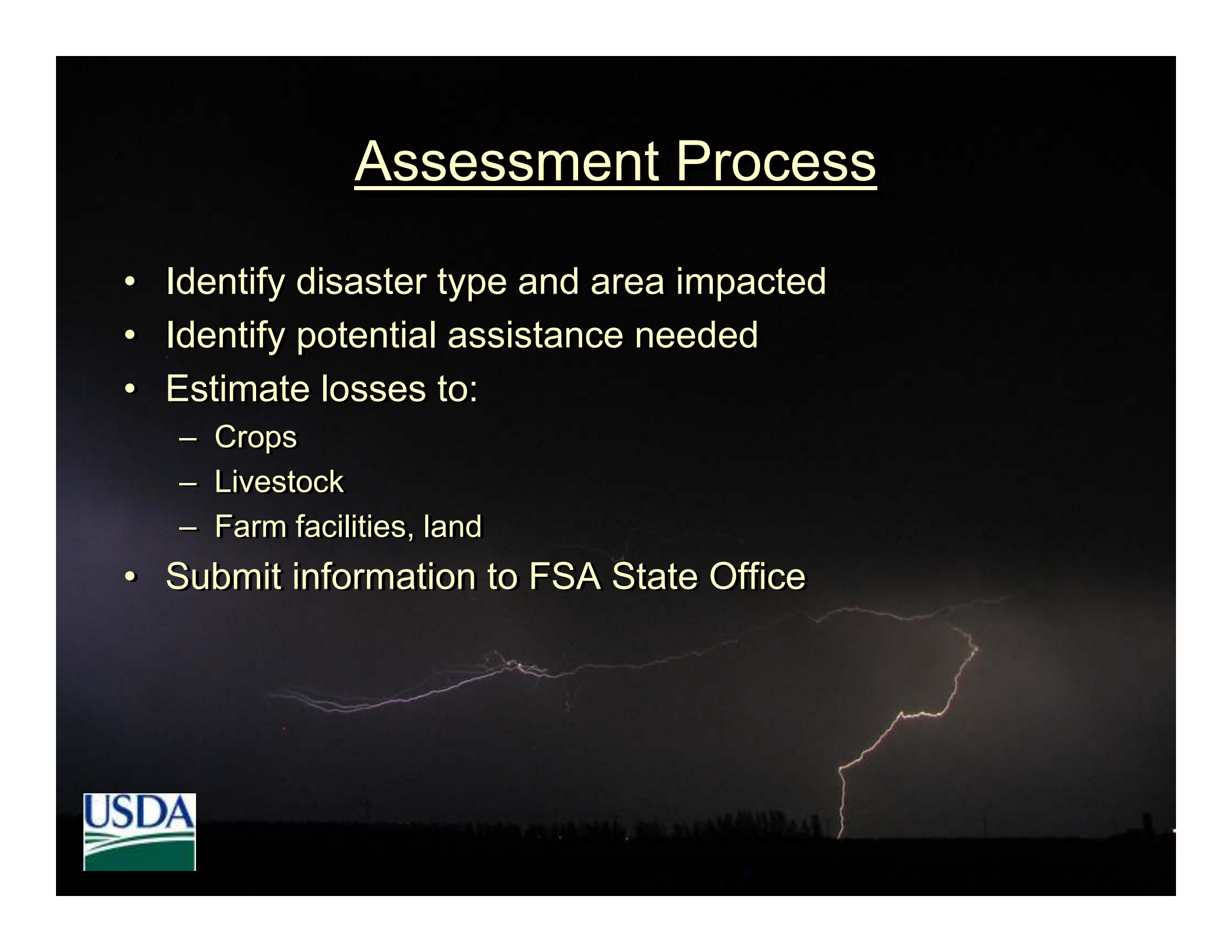
- Damages and losses must be due to a natural disaster
- Minimum 30% production loss of at least one crop in the county
- Most widely used and most complicated process

USDA Secretarial Designation, cont'd

1. Governor makes request within 3 months of disaster
2. FSA county offices assemble required loss information for the Damage Assessment Report (DAR)
3. FSA National Headquarters (NHQ) notifies State Executive Director (SED) of request, counties complete DAR
4. DAR submitted to State Emergency Board (SEB)
5. SEB reviews DAR and submits to NHQ
6. FSA Disaster Assistance Branch reviews information to be signed by Secretary

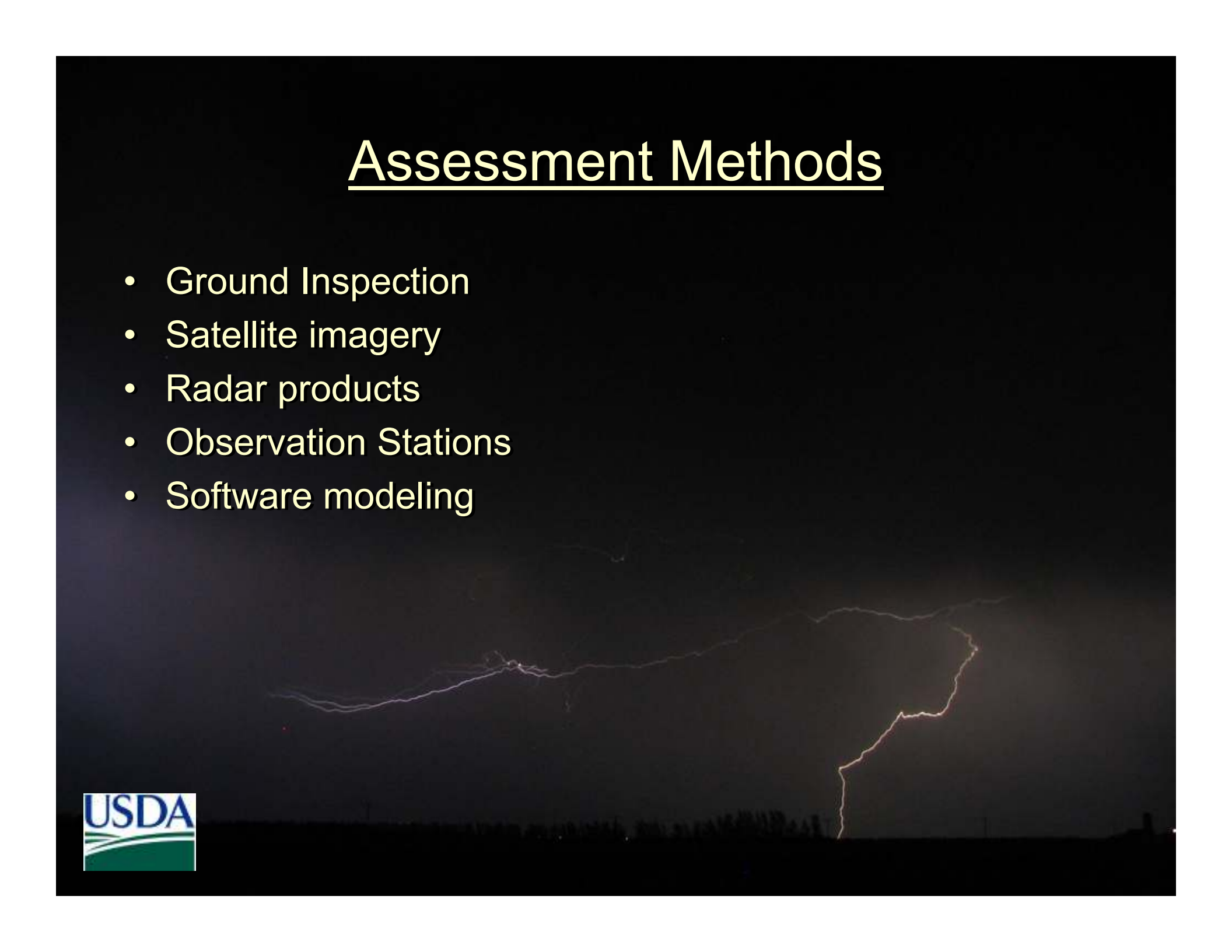
Assessment Process

- Identify disaster type and area impacted
- Identify potential assistance needed
- Estimate losses to:
  - Crops
  - Livestock
  - Farm facilities, land
- Submit information to FSA State Office



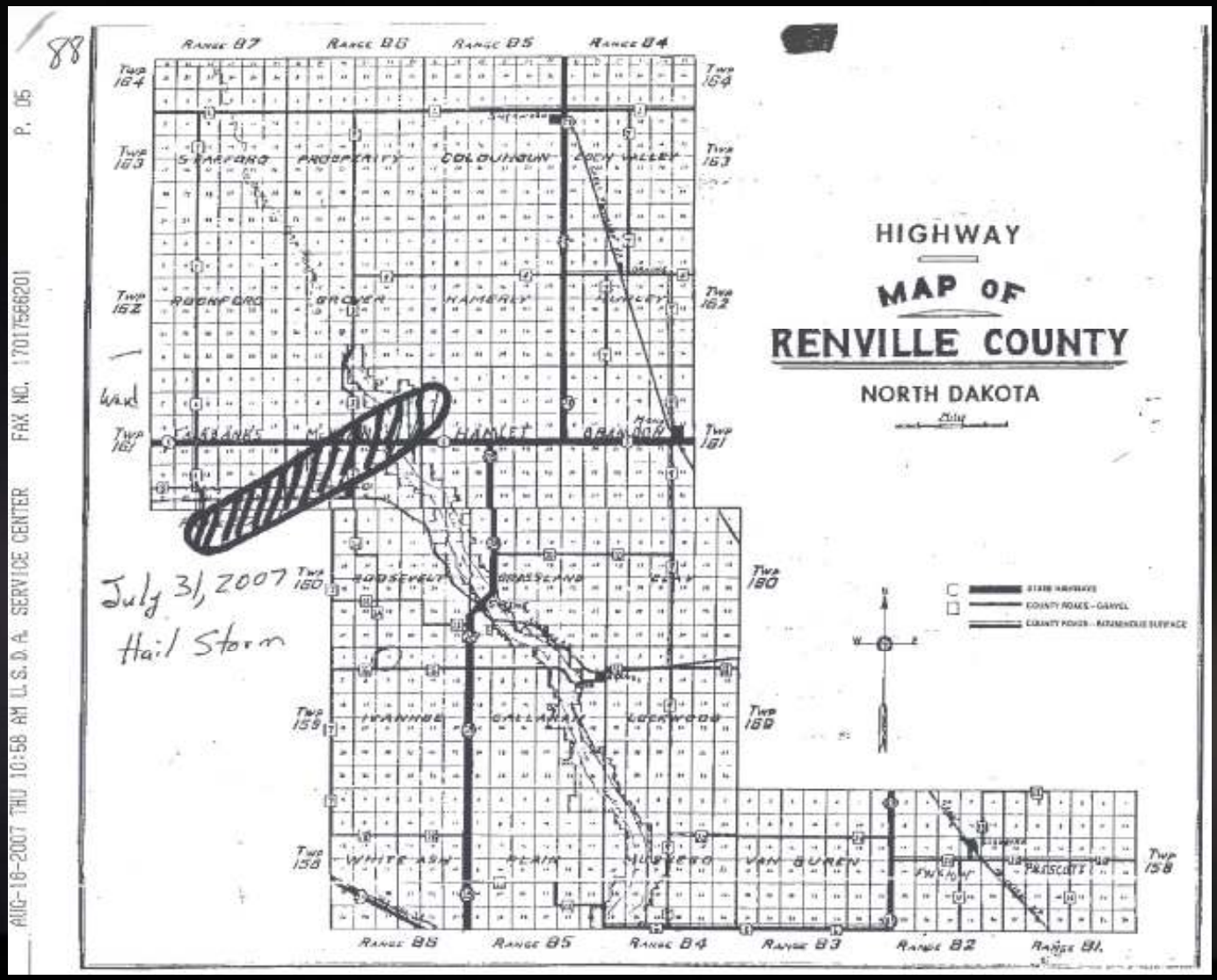
Assessment Methods

- Ground Inspection
- Satellite imagery
- Radar products
- Observation Stations
- Software modeling



- Frost Damage - August 2004

Existing Disaster Process

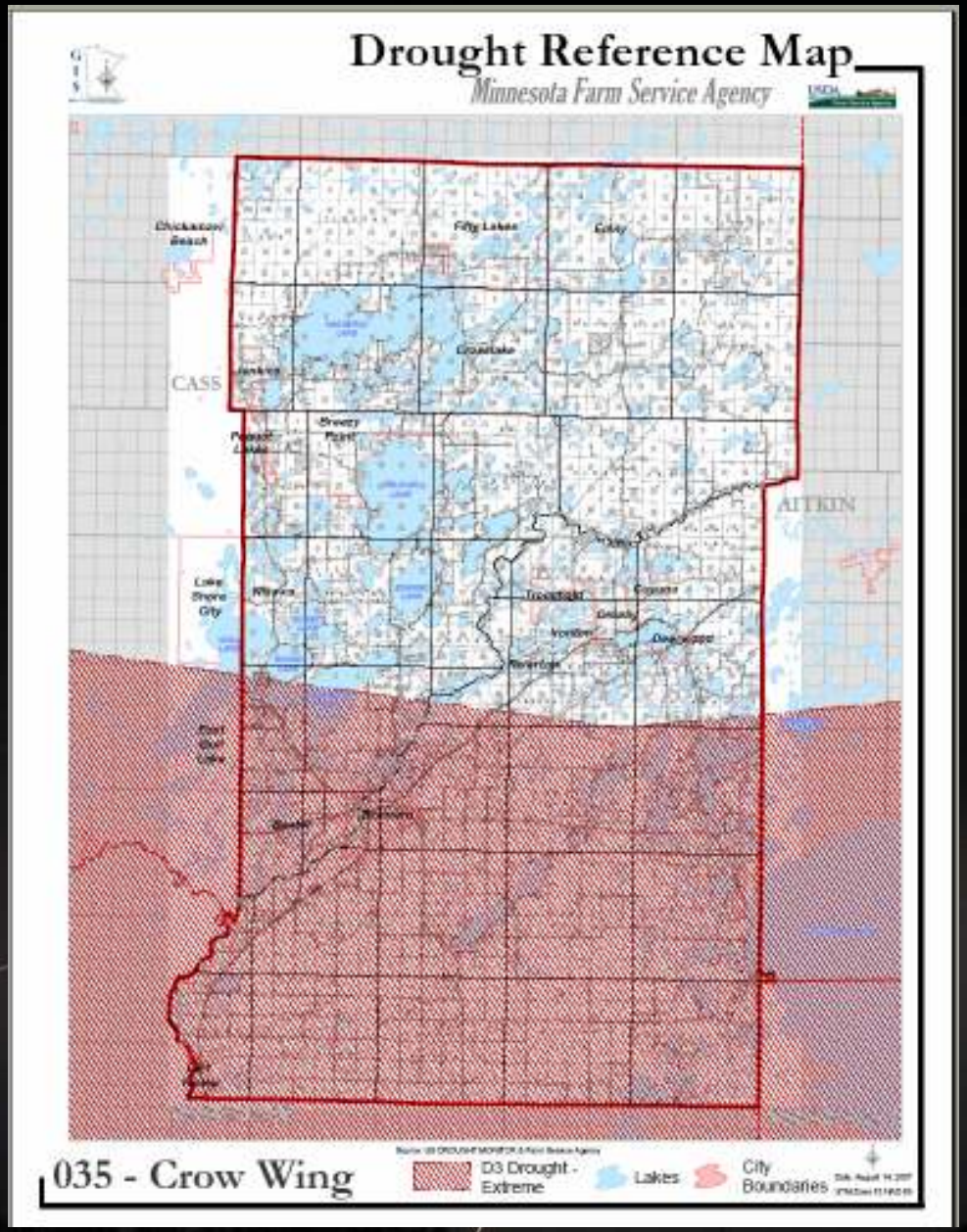


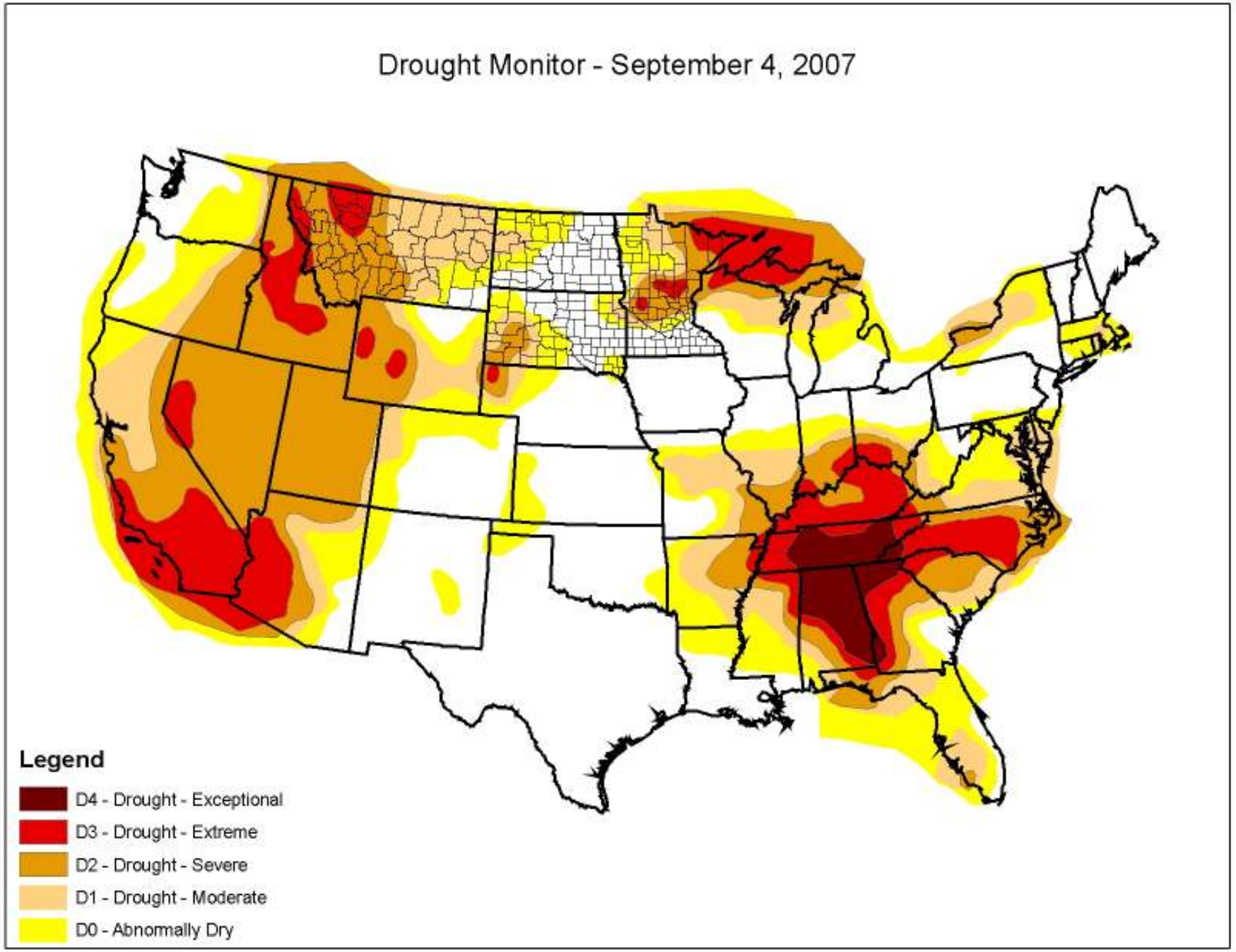
Room for Improvement

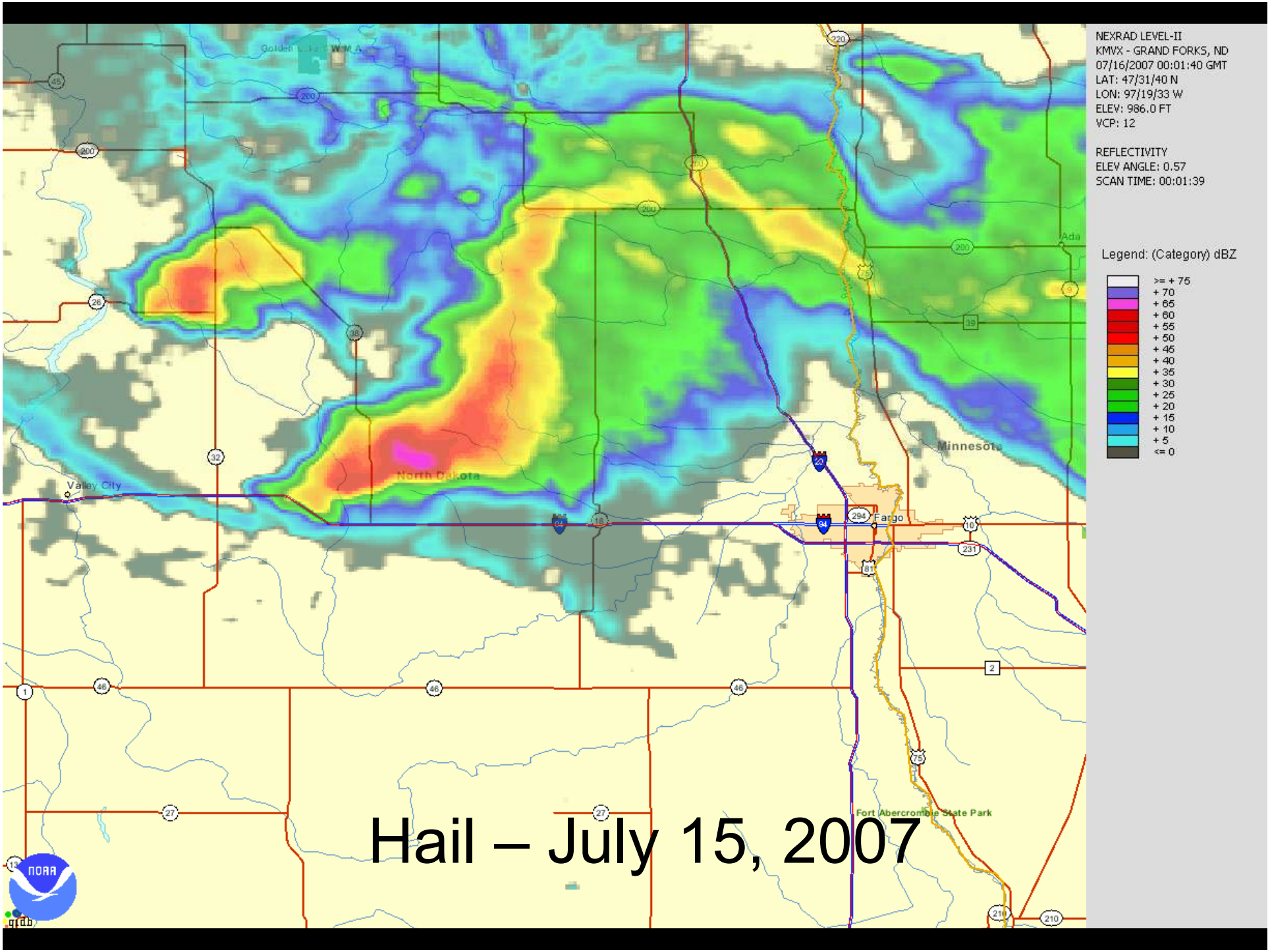
- Utilize technology
  - GPS
  - ArcGIS
  - Network infrastructure
  - RESULT: Better decision making support
- Improve communication
  - Increase awareness of disaster conditions
  - Proactive vs. reactive response?
  - RESULT: Better program delivery

Minnesota Drought

- Base map is scan of existing MNDOT map
- Time spent on developing disaster data, not basic cartography
- Product looks familiar to audience



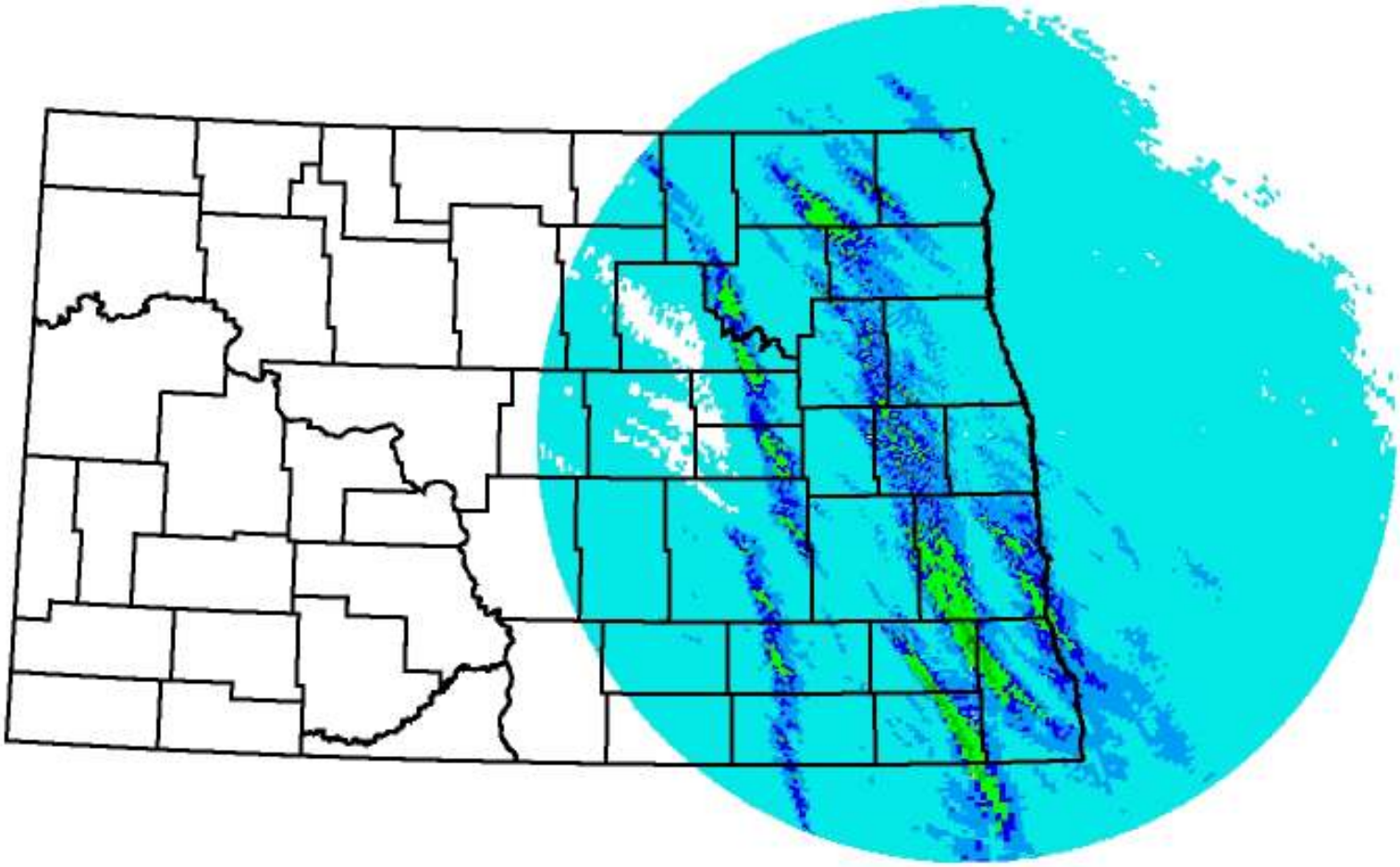

Drought Monitor - September 4, 2007
Legend
D4 - Drought - Exceptional
D3 - Drought - Extreme
D2 - Drought - Severe
D1 - Drought - Moderate
D0 - Abnormally Dry


NEXRAD LEVEL-II
KMVX - GRAND FORKS, ND
07/16/2007 00:01:40 GMT
LAT: 47/31/40 N
LON: 97/19/33 W
ELEV: 986.0 FT
VCP: 12
REFLECTIVITY
ELEV ANGLE: 0.57
SCAN TIME: 00:01:39
Legend: (Category) dBZ
>= + 75
+ 70
+ 65
+ 60
+ 55
+ 50
+ 45
+ 40
+ 35
+ 30
+ 25
+ 20
+ 15
+ 10
+ 5
<= 0
Valley City
North Dakota
Minnesota
Fargo
Ada
Fort Abercrombie State Park
Hail – July 15, 2007

Hail Storm - July 15, 2007

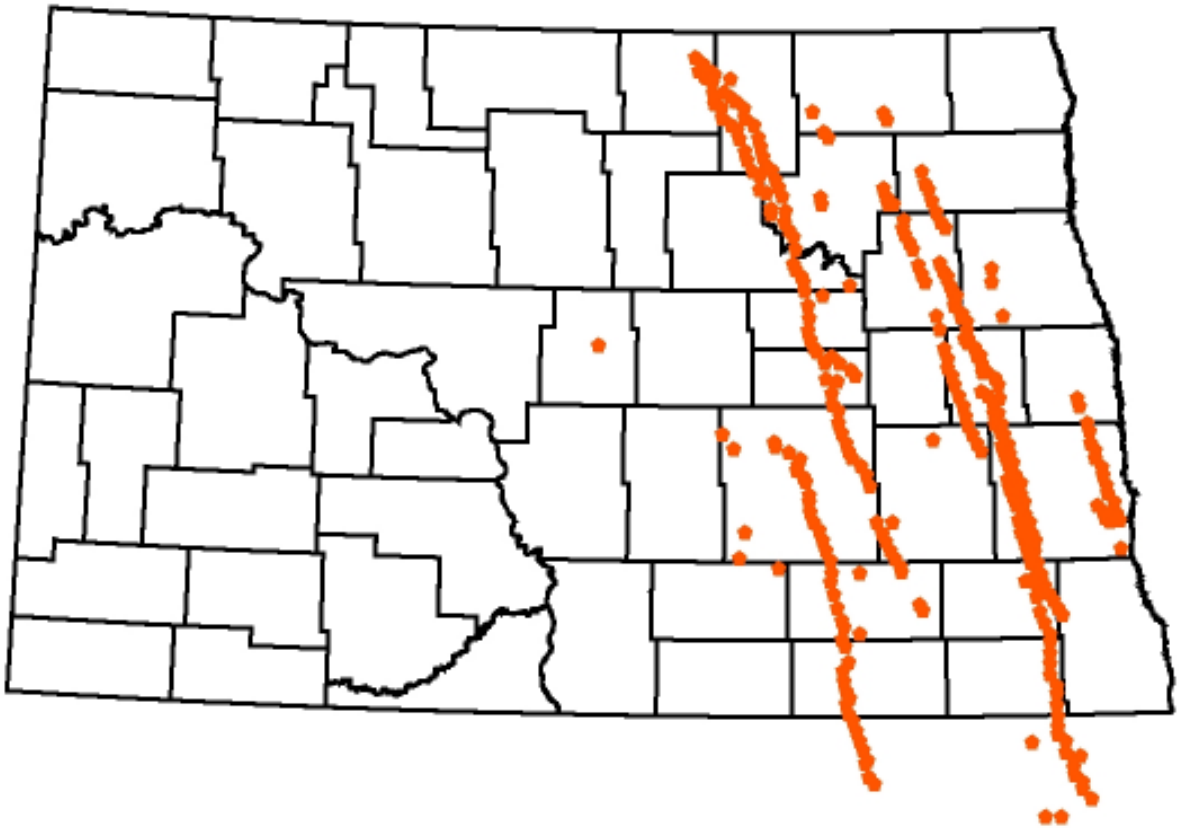
Hail Storm - July 15, 2007

National Weather Service Radar - Mayville, North Dakota
Storm Total Precipitation
July 15, 2007



FILE: mvx_ntp_0.gif
http://radar.weather.gov/GIS.html

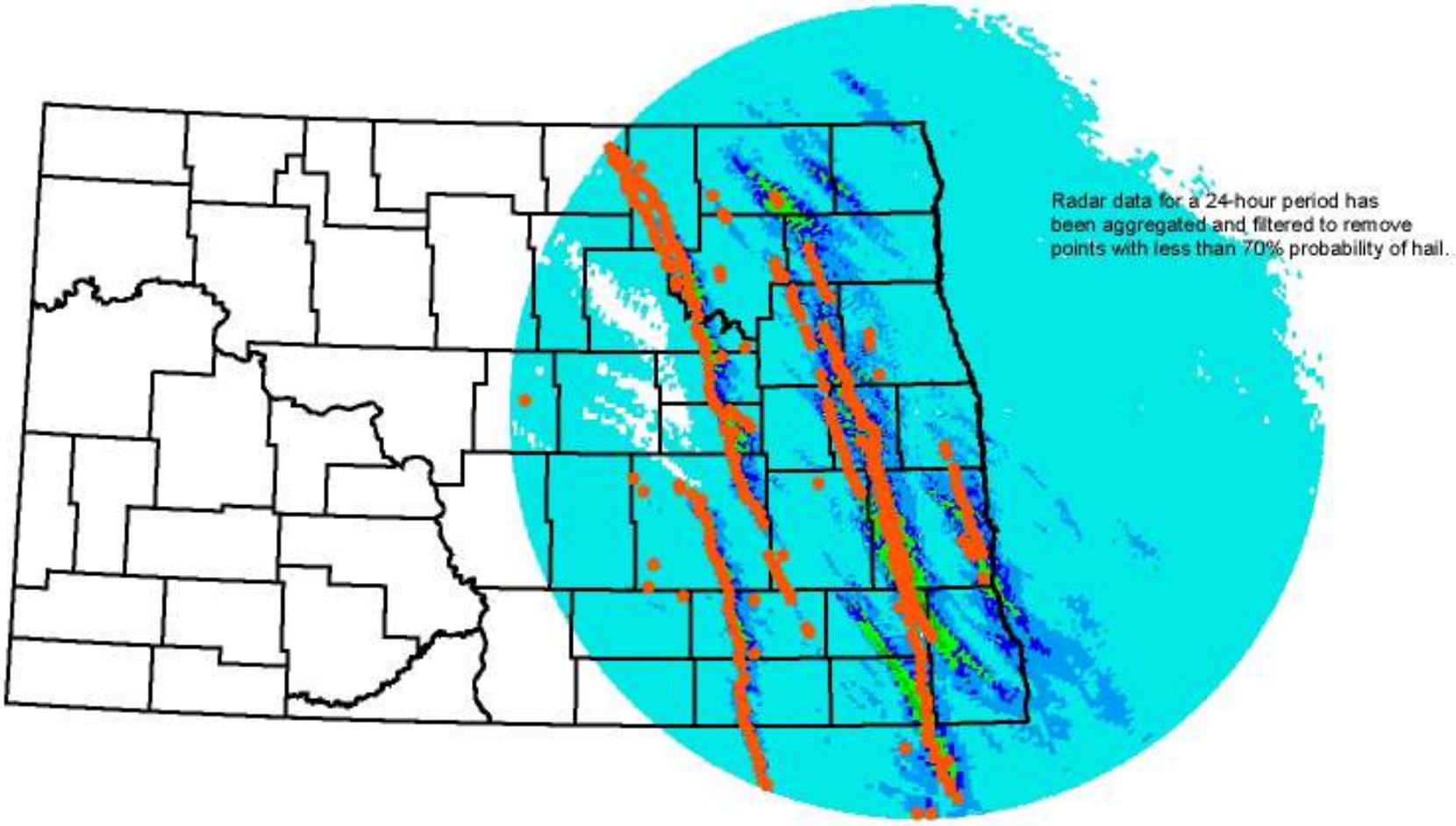
National Weather Service Radar - Mayville, North Dakota
NEXRAD Level-III Hail Index
July 15, 2007



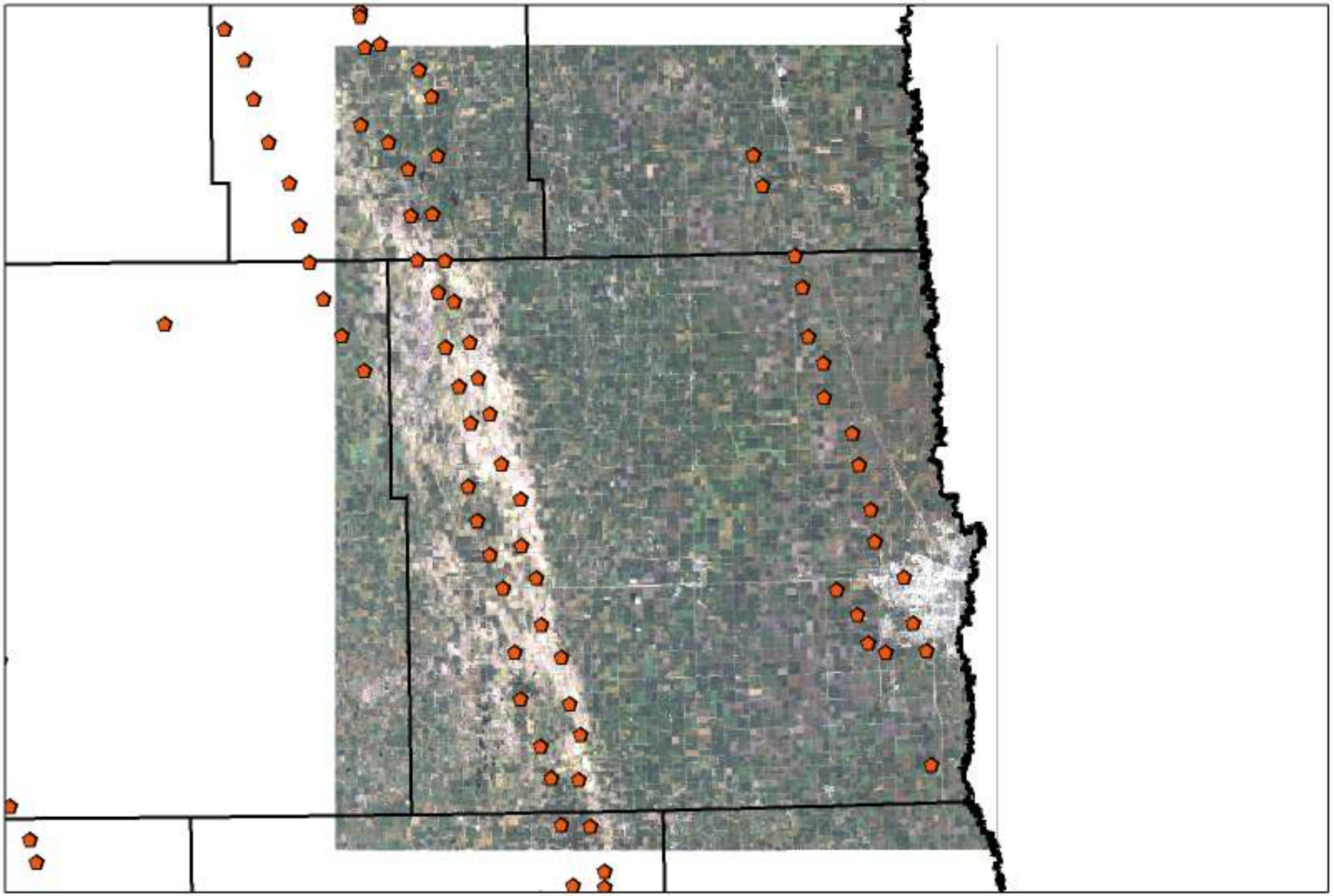
Radar data for a 24-hour period has been aggregated and filtered to remove points with less than 70% probability of hail.

FILE: kmvx_nhi_20070715
http://www.ncdc.noaa.gov/nexradinv/

National Weather Service Radar - Mayville, North Dakota
NEXRAD Level-III Hail Index with Storm Total Precipitation
July 15, 2007



National Weather Service Radar - Mayville, North Dakota
NEXRAD Level-III Hail Index with LANDSAT

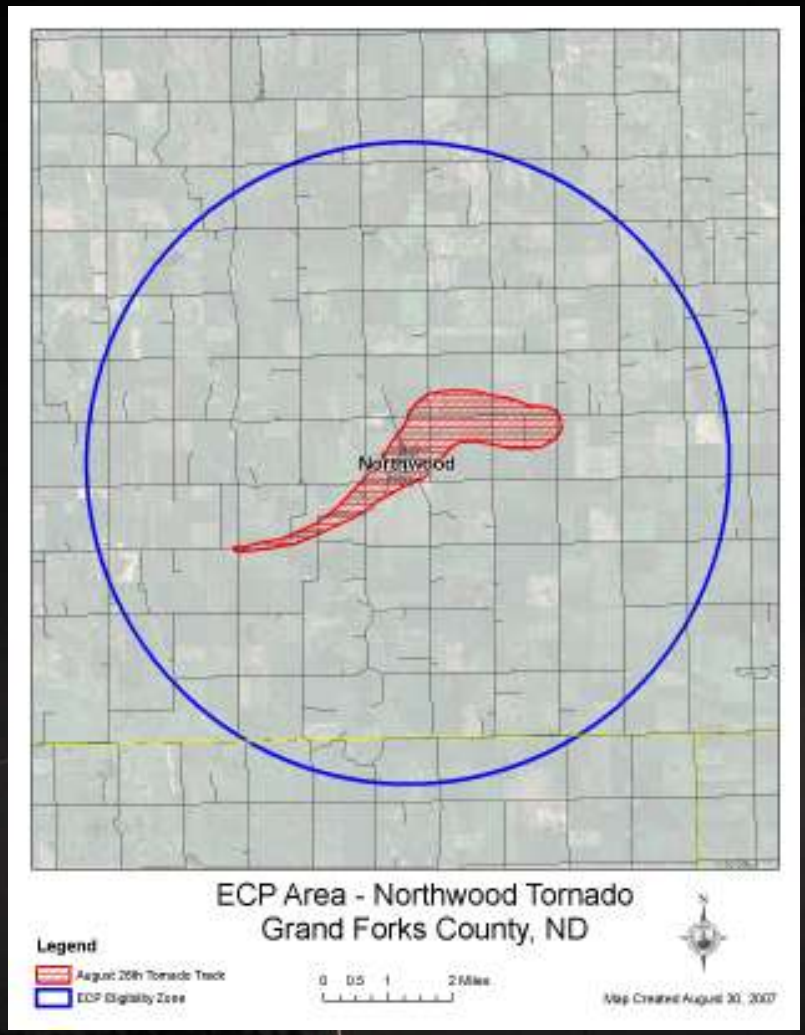


July Hailstorm

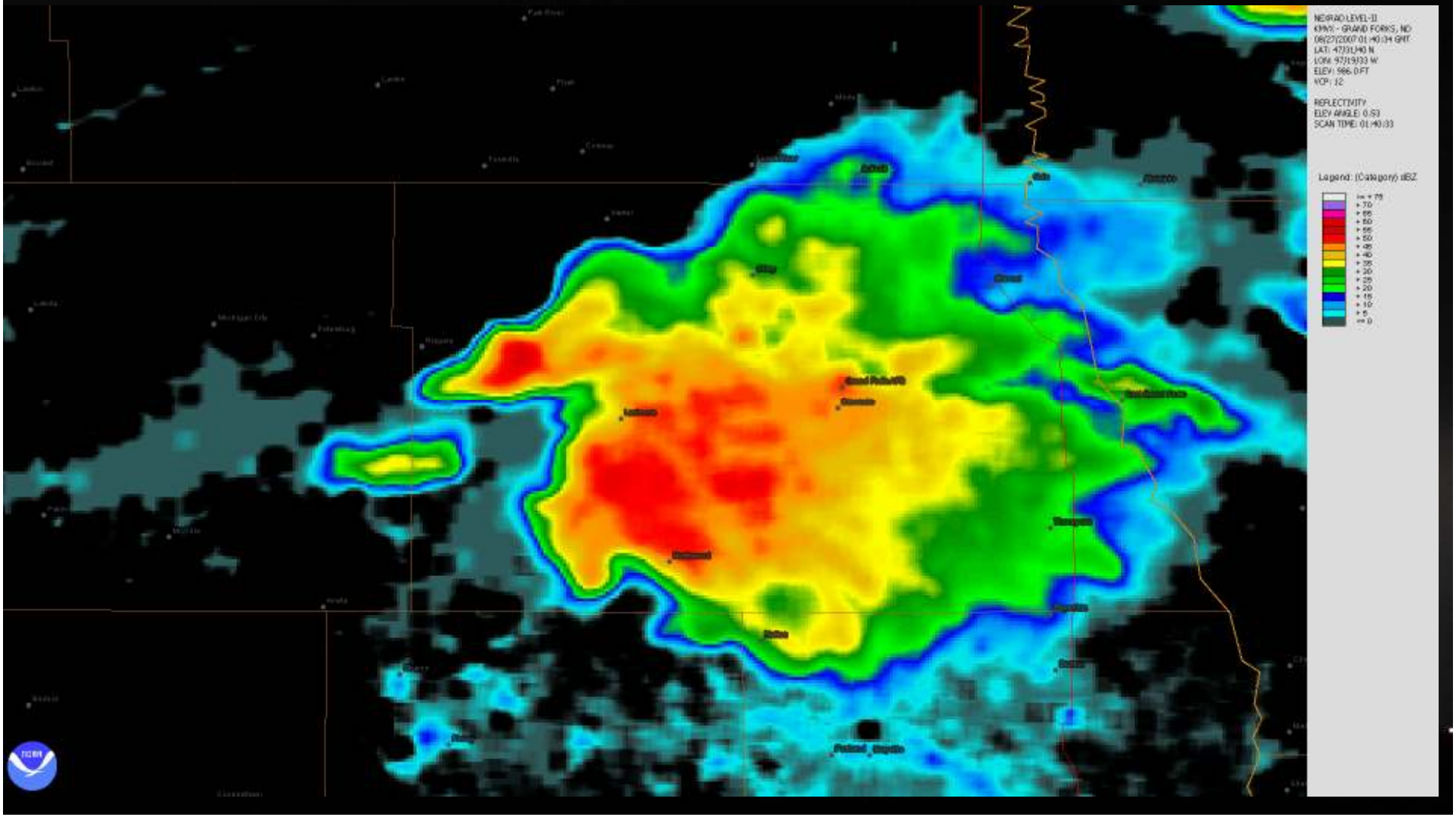
- Lessons learned:
  - Data is available if you know where to look
  - Many counties, many methods
    - GPS everything, no photos
    - Talked with farmers, sketched out with a marker, no field visit
    - Field visit, paper map documentation, photos

Northwood Tornado

- ECP available for debris removal from cropland
- Producers within 5 miles of town eligible
  - Buffer intersected with CLU layer to determine eligible producers
- Tornado track derived from NWS inspection data

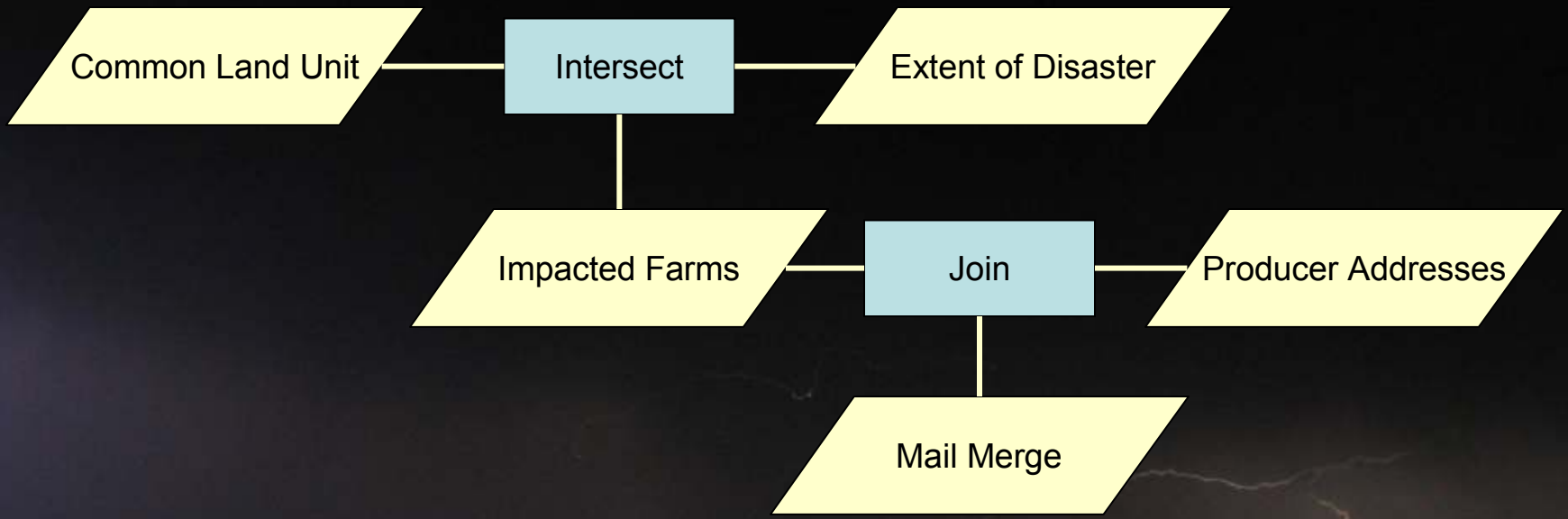


Northwood Tornado




BUMPER CROP?

Disaster Notification Process



Data Sources

- Common Land Unit
  - http://datagateway.nrcs.usda.gov/
- Radar Data
  - Current Radar Images
    - http://radar.weather.gov/GIS.html
  - Archived NEXRAD data (NCDC)
    - http://www.ncdc.noaa.gov/nexradinv/
- Drought Monitor
  - http://www.drought.unl.edu/dm/